RESERVE COPY.

PATENT SPECIFICATION

Application Date: Jan. 22, 1918. No. 1267/18. **191,407**

Accepted: May 14, 1918 (but withheld from Publication under Section 30 of Patents and Designs Acts 1907 and 1919).

Authorised to be Published: Dec. 13, 1922. Date of Publication: Feb. 8, 1923.

COMPLETE SPECIFICATION.

Improvements in Electrically Driven Gyroscopes.

I, ARCHIBALD MONTGOMERY LOW, Captain in His Majesty's Army, of Royal Flying Corps Experimental Works, Feltham, Middlesex, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to electrically driven gyroscopes and has for its object to provide an improved device of this nature of simple and efficient construction and to furnish means whereby the device may be deflected to one side or the other within limits, it thus being particularly suitable for use in connexion with the control of torpedoes, aeroplanes or other devices which it may be desirable to steer or guide in their course.

The invention is to be distinguished from mechanically driven gyroscopes which have sometimes been provided with means for effecting lateral deflection, and consists in an electrically driven gyroscope provided with means whereby the gyroscope member may be deflected to one side or the other as desired.

The invention also consists in an electrically driven gyroscope comprising an armature, a main field and two auxiliary fields respectively in advance and retard of the main field, so that by energising one or the other in addition to or instead of the main field the speed of the armature will be accelerated or decelerated, whereby the gyroscope is caused to precess in one direction or the other for the purpose of steering.

The invention also comprises the electrically driven gyroscope hereinafter described and illustrated.

The accompanying drawings illustrate one form of gyroscope in accordance with the invention:—

Figure 1 being a transverse sectional elevation; while

Figure 2 is a diagrammatic view showing the scheme of connections and a portion of the gyroscope in side elevation.

In carrying my invention into effect in the manner illustrated I form my improved gyroscope with a gyroscope wheel *a* of any suitable formation and mounted in the usual casing *b* in such a manner as to provide three axes *c d* and *e* at right angles to one another.

The armature of the gyroscope is formed by means of a plurality of turns *f* (one only being shown in the drawing) wound through a series of apertures formed in the wheel or disc *a* and bound together and supported if necessary by a number of wires or other binding members *g*.

The turns are adapted to project from either side of the wheel as shown and are partially embraced by the pole-pieces *h* of the main field *i*, the latter being conveniently excited from any suitable source *k* (Figure 2) of alternating current electricity.

In addition to the main field *i* I provide two auxiliary fields *l m* which are respectively arranged in advance and retard of the main field, so that by selectively exciting one or other of these auxiliary fields in addition to or instead of the main field the speed of the armature will be accelerated or decelerated, with the result that the gyroscope member will be caused to precess in one direction or the other and will thus be deflected laterally in one or other direction about the axis *d*, so that the torpedo, aeroplane or other device in connexion with which the gyroscope is employed may have its course altered within limits to one side or the other as may be desired.

The excitation of the auxiliary fields may be effected wirelessly or otherwise in any suitable manner by means, if necessary, of any desired form of relay and in place of providing two auxiliary fields adapted to be selectively excited I may provide a single field with means for exciting the same in one direction or the other according as the gyroscope is to be steered to one side or the other.

It is to be understood that the invention is not to be confined to the particular details hereinbefore given by way of example as I may modify the arrangement of the circuit or circuits, the size and form of the gyroscope member and the manner of constructing and mounting the gyroscope as may be found most suited to any particular practical requirements.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An electrically driven gyroscope provided with means whereby the gyroscope member may be deflected to one side or the other as desired.

2. An electrically driven gyroscope comprising an armature, a main field and two auxiliary fields so arranged that by energising one or other of such auxiliary fields the gyroscope member may be deflected to one side or the other.

3. An electrically driven gyroscope comprising an armature formed from a plurality of turns wound through apertures in the gyroscope member.

4. An improved electrically driven gyroscope substantially as hereinbefore described and as illustrated by the accompanying drawings.

Dated this 2nd day of January, 1918.

MARKS & CLERK.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1923.

[This Drawing is a reproduction of the Original on a reduced scale]

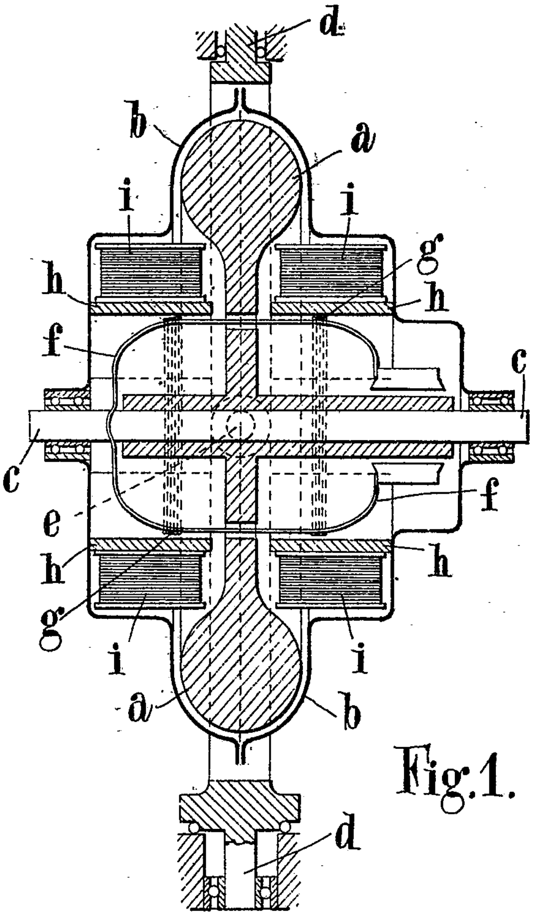

Fig.1.

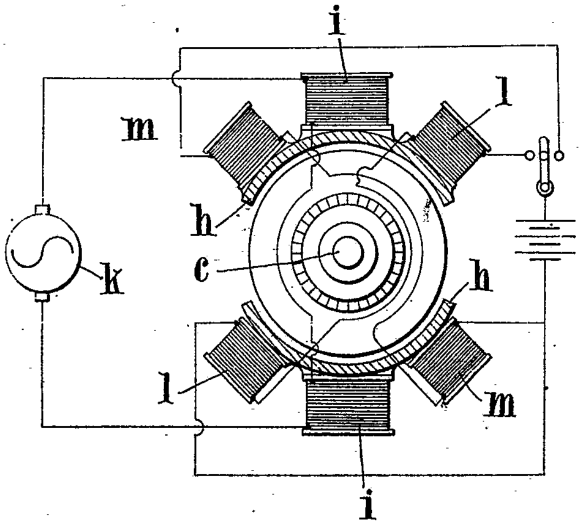

Fig.2.

Malby & Sons, Photo-Litho